



COASTAL PLANNING & ENGINEERING, INC.

2481 N.W. BOCA RATON BOULEVARD
BOCA RATON, FLORIDA 33431
PH. (561) 391-8102 FAX (561) 391-9116

TITLE:

**BOGUE INLET, NC
14' MLW CHANNEL WITH
CLOSURE DIKE - PEAK EBB**

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FIGURE NO. 7B

With the dike and the extra fill in place, flow is concentrated in the new channel and significantly reduced in the existing channel. Along Transect 6, velocities are reduced from the existing conditions by 60 percent during peak flood and over 90 percent during peak ebb. By significantly reducing the flow through the existing channel, the dike and the new channel should be able to reduce the erosion along the west end of Emerald Isle.

Placing the dike will minimize changes to the tidal prism. Discharges through Transect 7 are much closer to the existing conditions than the scenario in which the present channel remains open.

-14 foot MLW Channel with Closure Dike

Figure 8 shows the peak flows occurring while the closure dike is midway through construction. At this phase of construction, the elevation of the dike is roughly equal to mean tide level, +0.4 feet NGVD. As Figure 6, Figure 8, and Appendix B shows, the flow patterns are similar to those expected when the dike is absent. Peak velocities at the dike location will continue at similar rates until the elevation of the dike is raised above mean higher high water. This tendency must be taken into account when planning the construction of the dike.

Conclusions

- The existing flow regime in Bogue Inlet consists of a sheet flow through the mouth of the inlet, with heavy concentration of flow adjacent to the west end of Emerald Isle. The largest currents are on the order 3 feet per second. Sheet flow also occurs across the sand spit protruding from the northwest tip of Emerald Isle. Inside the inlet, the majority of the flow circulates around the southern and eastern edges of Dudley Island, with a concentration of flow near its southern edge.
- The new channel alignment will increase flow through the center of the inlet. However, without a closure of the existing channel, there will still be a substantial concentration of flow adjacent to Emerald Isle. The concentration of flow near the southern bank of Dudley Island will remain.
- Velocities in the existing channel can be reduced sufficiently by constructing a dike to close the channel and raising the elevation of the Emerald Isle sand spit to +3 feet NGVD.

